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ABSTRACT

The interest of the psychologist in bilingualism from its origins in the early 1900's to the present is traced. Bilingualism and intelligence are discussed as well as some recent studies on bilingualism and cognitive development. Several areas where psychologists may provide valuable insights into the process of becoming bilingual are discussed with their educational applications. It is suggested that studies of the relationship between intelligence and bilingualism have been unhelpful because: they lacked proper controls; standardized tests almost always discriminate against those (e.g., most ethnic groups) who were not part of the standardization sample; and such tests allow little direct access to the nature of cognitive processing involved. Many of the studies on bilingualism and cognitive development have sought to demonstrate that there are no cognitive "deficits" resulting from bilingualism, and most recent studies seem to wish to demonstrate that "bilingual is better." Some investigators are interested in the theoretical basis of cognition and have found bilingual subjects an interesting group to study. Studies have also been motivated by the belief that the practical issues of bilingual education, such as language learning and literacy, may be based in important ways on cognitive skills. Two areas of research that remain practicable and interesting are within-population experimental designs relating linguistic proficiency to cognitive skills, and the study of reading acquisition in first and second languages. (SW)

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COGNITIVE PERSPECTIVES ON BILINGUALISM IN CHILDREN

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I. INTRODUCTION

In the present discussion, I would like to trace briefly the psychologists' interest in bilingualism from its origins in the early 1900's to the present. First, I will discuss the issue of bilingualism and intelligence; then, some recent studies on bilingualism and cognitive development; and finally, several areas where psychologists may provide valuable insights into the process of becoming bilingual and how we might possibly provide for such individuals in our educational system.

II. BILINGUALISM AND INTELLIGENCE

Since standardized intelligence tests became popular in the 1920's, psychologists have tried to apply these measures to many types of subject populations. These early tests (and some recent ones) quite often found ethnic groups to be inferior in I.Q. with respect to American mainstream cultural groups (usually white middle class groups). It was in this era that bilingualism and intelligence were first studied together (e.g. Saer, 1923, Smith, 1923).

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Lower I.Q. scores among bilinguals, who often composed a substantial proportion of these ethnic groups, were explained as some sort of "deficit" that bilinguals suffered from, due to having to learn, and/or having learned, two languages instead of one. Interestingly, this view was considered to be "liberal" in that it provided alternative to the biogenetic hypothesis of racial and cultural differences in intelligence.

Major reviews of the pre-1960's literature on the relationship between bilingualism and intelligence (e.g. Darcy, 1953, 1963; Haugen, 1961; Peal & Lambert, 1962), concluded that most previous studies were, on the whole, contradictory. And, since most intelligence tests were conducted in English, some investigators--not surprisingly--began to wonder if perhaps non-native English speakers were not understanding the task at hand. Also, many of these earlier studies lacked prosper experimental controls on such variables as socio-economic class, degree of bilingual proficiency and type of tests used. Measurement of the degree of bilingual proficiency has been a special problem not only because proficiency has so many different dimensions, but also because bilingualism itself has been defined in the literature in very different ways. For example, Bloomfield (1933) defined bilingualism as n"native-like control over two languages", whild Macnamara (1967) stated that bilinguals were those "persons who possess at least one of the language skills (i.e. speaking, writing, listening, or reading) even to a minimal degree in their second language." Thus, it would appear that any investigator who

wishes to study bilingualism will have to establish some arbitrary criteria to control for proficiency.

In sum, studies of the relationship between intelligence and bilingualism have been unhelpful because they lacked proper controls. Furthermore, studies such as these will probably remain unhelpful because standardized tests almost always discriminate against those (e.g. most ethnic groups) who were not part of the standardization sample, and because such tests allow little direct access to the nature of cognitive processing involved.

III. BILINGUALISM AND COGNITIVE DEVELOPMENT

With the increasing popularity of theories of cognitive development -- such as those of Piaget and Bruner -- some psychologists interested in bilingualism have studied the level of various cognitive abilities in monolingual and bilingual children. The motivation for these studies seems to be three-fold: first, there remains interest in demonstrating that there are no cognitive "deficits" that result from being bilingual -- indeed, most recent studies seem to wish to demonstrate that, in fact, "bilingual is better"; second, some investigators are interested in the theoretical basis of cognition, and have found bilingual subjects to be an interesting group to study; and third, the practical issues of bilingual education, such as language learning and literacy, may be based in important ways on cognitive skills.

In a recent review, Lambert (1977) has suggested that bilinguals, relative to monolingual controls, show "definite advantages of 'cognitive flexibility,' 'creativity', or 'divergent thought'". Interestingly, the positive or "advantage" hypothesis that bilinguals are more flexible or more creative seems to be derived

from a much earlier negative or "deficit" hypothesis, namely, that bilinguals must suffer from "mental confusion", due to interference between their two (or more) codes. Leopold (1949), in studying his own bilingual child, was one of the first investigators to suggest that an advantage might result from bilingualism. His hypothesis was that the bilingual child probably has an early ability to separate the word as a symbol from its referent, i.e. a headstart in abstract thinking.

In the search for the advantages of bilingualism, a number of studies have followed up on Leopold's abstract thinking hypothesis. For example, Ianco-Worrall (1972) tested 4 to 9 year old bilingual and monolingual children on a task where words had to be grouped by either semantic or phonetic similarity. Results indicated that the bilingual 4 to 6 year olds sorted semantically significantly more than the monolingual control group -- indicating that they were abstracting meaning while monolingual children were still sorting by simple speech sounds. However, for the older 7 to 9 year olds, there were no differences in sorting, indicating, according to Ianco-Worrall, that the bilingual advantage may be short lived. In two recent studies, Ben-Zeev (1977 a,b) has tested 5-10 year old children from two bilingual communities on a range of cognitive tasks. In both studies -- of Hebrew-English speakers and of Spanish-English speakers -- Ben-Zeev found evidence that bilinguals, relative to monolingual controls, scored equal or higher on a variety of cognitive tests, with most of the "advantage" appearing at younger ages. The salient exception was of the Peabody Picture Vocabulary Test, where monolinguals were superior due probably to a richer vocabulary in a single language.

In a similar manner, Bain (1975) compared French-English bilingual children

with monolingual controls, and found a bilingual advantage in numerical series problems; this difference was significant at 6-8 years of age, but, as in the above studies, the difference disappeared by about age 12.

This brief review does, indeed, seem to support Lambert's (1977) contention that "there is a definite advantage enjoyed by bilingual children in the domain of cognitive flexibility" (p. 18). But what about all those earlier studies showing bilingual "deficits"? Most of the early studies in the period 1920-1950, considered the effects of bilingualism in predominantly lower-class ethnic communities. We have already noted that testing methodology was unsatisfactory in that epoch. Also, many bilingual children had only limited degrees of competence in their second language. More recent studies which have shown positive effects of bilingualism, have primarily involved "balanced" bilinguals -- that is, those who were chosen because they were more-or-less equally competent in both languages. Furthermore, some studies (e.g. d'Anglejan & Tucker, 1975) have shown that moderate differences in bilingual ability have little effect on cognitive outcomes. Therefore, it may be the case, as suggested by Cummins (1976), that some minimum level of bilingual or second language competence is necessary to promote cognitive skills, as demonstrated in the recent studies discussed earlier.

While this all seems to fit into a nice package -- and conforms to the ideological desires of many concerned with problems of bilingual education and particularly with those combatting anti-bilingual/anti-ethnic prejudice -- I would like to suggest, in spite of the evidence presented, that the cognitive "case" is far from closed. Why is this so? There are a number of compelling reasons: First, even the "best" studies -- like those discussed above -- contain their own problems of

interpretation and methodology, that call the results into question. For example, most claim that cognitive advantages are predominant in younger rather than older subjects. Why should this be the case, if we believe that: a) most of intellectual development is additive in the sense that differences accelerate and group scores diverge increasingly with time; and b) if bilingual "balance" is important for cognitive development and for most children "balance" seemed to be achieved with increasing age (through school at least). It does not follow, therefore, that as bilingual balance is approached that cognitive differences disappear -- just the opposite would be predicted. Also, there remains, despite the best intentions of the experimenters, the problem of fair or controlled comparison between the bilingual groups and monolingual controls. For example, in the Ben-Zeev (1977b) study, the Spanish-English bilinguals were significantly superior to the monolingual controls on the WISC I.Q. test. This result reduces the strength of her arguments, because bilingual children, in the sample she selected, may be more "flexible" and more "creative", simply because they are smarter. Studies which have selected balanced bilinguals (e.g., Ben-Zeev 1977a, b; Bain 1975; Cummins 1977) have to deal with the problem of confounding general intelligence and bilingual ability. That is, it may be that balanced bilinguals are smarter, but it may also be that children have to be smarter, or have complex cognitive skills, to become balanced bilinguals. This is a problem that is extremely difficult to resolve.

IV. DIRECTIONS FOR FURTHER RESEARCH

After pointing out all these methodological pitfalls, one may wonder if there is something reasonable and tractable that developmental or cognitive

psychology might offer to those interested in the study of childhood bilingualism and bilingual education. Let me mention two areas of research that remain practicable and interesting: Within-population experimental designs relating linguistic proficiency to cognitive skills; and the study of reading acquisition in first and second languages.

With respect to within-population designs, I mean the use of in-depth studies of children becoming bilingual within a single community. That is, rather than comparing bilinguals with ill-defined monolingual controls, I would suggest relating individual differences in bilingual proficiency to various cognitive skills. Since there is little reason to believe that cognition necessarily causes language acquisition, nor vice versa, there is little reason to opt for determinate sorts of ANOVA or group difference techniques over simpler correlational or multiple regression techniques, which may be done within a given population. It is now fairly well known that there exist large individual differences in monolingual's language acquisition (c.f. Brown, 1973), as well as in bilingual's second language acquisition (c.f. the recent work by Wong-Fillmore, 1976). In a manner similar to that of Carroll (1963), who related cognitive abilities like rote memory and rule learning ability among adult second language learners, it would be quite interesting to see how language and cognitive development are related in children. By eliminating the between-group design, we eliminate many of the confounding variables of earlier studies.

A second area that would be interesting to unravel is that of acquisition of reading skills or literacy in a second language. This is not a new topic, but it it apparant that much research on reading up to the present has been hampered by many of the control or comparability issues just described. For example, in the off-cited study by Modiano (1972) in Mexico, Mayan children's

literacy in Spanish was found to be improved when the children were first taught to read in Mayan. The problem here is that special instruction by motivated instructors was also likely to improve performance in these children. Thus, we are not sure whether native-language literacy in all cases or in any case is the causal factor for increased literacy. Simply having bilingual or Mayan instructors -- rather than Mestizo "foreigners" -- might be just as effective as native-language literacy programs. Related to Modiano's work is an important question -- that of transfer from native language literacy to second language literacy. Not enough research has been devoted to this important topic, and little use has been made of the work of cognitive psychologists on reading. Among psychologists, the topic of how differing orthographies are related to decoding processes in reading has received considerable attention recently. For example, it has been found that Chinese and English monolingual readers vary in the kinds of cognitive or inference rules by which they attempt to decode a written passage (Treiman, 1977). One might ask, therefore, how these different rule systems may affect reading acquisition in the young Chinese-English bilingual? How do these rules operate and/or interfere with respect to orthographies with varying contrast -- such as Spanish-English or Arabic-English? Another related issue is that of individual styles in reading recently studied in English monolinguals (Baron, 1977). How might these styles vary by differing orthographies and with respect to learning to read in two orthographies?

These are only some of the areas in which cognitive psychology might contribute in fruitful ways to the study of child bilingualism and bilingual education. I would like to conclude with something that seems not only obvious but crucial:

That there are many levels at which we may examine bilingualism, and interdisciplinary efforts will be necessary to produce an integration in this complex field of inquiry.

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